

# Can we hear space?



A project for early education

## Summary of activity

Sounds might not be the first thing we think about when we think about space, but this is really a topic where we can create true wonder amongst the children.

Through the activities in this booklet the children can wonder about how sounds are made and what happens when sounds reach the emptiness of space.

The activities are related to many bullet points in the Norwegian curriculum and facilitate for children's initiative, wonder, curiosity, creativity, learning and faith in their own abilities.

This booklet is a part of a series of topics about space. All themes and activities are created for the possibility of use in big or small projects about space in early education. Allow the children to choose the direction of the project. Use one or all of the activities to create a connection between the themes in the project. Remember to document what you do so it can be shared with others.

## Curriculum (Norwegian Rammeplan for early education)

The primary goal of the kindergarten is to promote learning. In the kindergarten, the children will experience a stimulating environment that supports their desire to play, explore, learn and master (...).

The children's curiosity, creativity and desire for knowledge should be recognized, stimulated, and create a foundation for their learning processes.

The children should examine, discover, and understand relationships, expand their perspectives and gain new insights.

The children will	The staff will
<ul style="list-style-type: none"> <li>• Experience, explore and experiment with natural phenomena and the laws of physics</li> <li>• Construct from different materials and explore the possibilities of tools and technology</li> <li>• Draw on their imagination, creative thinking and enthusiasm</li> </ul>	<ul style="list-style-type: none"> <li>• Observe, analyze, support, participate in and enrich the play on the children's terms</li> <li>• Be conscious of and assess their own role and participation in the children's play</li> <li>• Highlight and create aesthetic dimensions in the kindergarten's indoor and outdoor spaces</li> </ul>

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## Sounds in space

We hear sounds all the time. Even when we think it's completely quiet, we hear noises from ventilation systems, or the whistling of the wind. It is almost impossible to find a place on earth where it is completely, completely quiet. But what do the sounds sound like in space? Or on the other planets? How are the sounds made? This is a topic where children can wonder about a lot, and where they can explore the vibrations that make sounds.

### What is sound?

Sounds are vibrations that move like waves - sound waves - until they hit the ear. Inside the ear, the waves create vibrations, and we hear the sound. It is the size of these waves that determines whether the sound is loud, low, light or dark.



*Image: Generative AI*

Sound travels through all kinds of matter such as air, water, or solid materials. Sometimes the sound is fast, other times slow. Some materials produce an extra clear sound, such as metal, while other materials, such as water, distort the sound and it becomes indistinct. No matter where we are on earth, there is something that sound can travel through. That's why there are so many different sounds here. But what happens when the sound reaches space? What does it move through then?

### Sounds in space

In space there is only vacuum, empty space. This means that there is nothing the sound can travel through, and therefore it is completely silent. So, imagine a spaceship taking off from Earth. The engines roar and you hear the vibrations from all around. The ship rises through the earth's thick atmosphere, and we can still hear the roar of the engines. We imagine we can follow the ship up through the atmospheric layers, we still hear the sound. We reach about 100 kilometres altitude, the place where the atmosphere ends and space begins. The air

becomes thinner, and the pressure falls below 1 pascal. We suddenly find ourselves in a vacuum, and the sound disappears.

There is nothing here the sound can move through, so suddenly we will not hear anything at all. (Except inside the spaceship, of course)

In sci-fi movies, it is not unusual to see spaceships shooting through space while the sound of the engines thunder. That will not be the case in reality. We also cannot hear when two asteroids collide. Not even a massive supernova explosion will be audible to us.

Nevertheless, we have heard that NASA has recorded sounds from various things in space. How is it possible? The major space agencies have many instruments placed in space. Many of these pick up different waves, ultraviolet waves, electromagnetic waves, radio waves and so on. These waves can be turned into vibrations, so that we can hear what they would sound like.

### Sounds on other planets

It is only in a vacuum that sound does not carry. Most of the planets in our solar system have some form of atmosphere, except for Mercury, which is constantly being scorched by the strong solar radiation. If we could stay on the surface of the planets, we could therefore have heard some sounds there. Unfortunately, most planets are not very healthy for us humans, so we don't get to try it out right away.

NASA has made a small video with sounds they have recorded on the different planets in our solar system. These are probably not the sounds we would have heard if we were standing on the planet, but this is the sound produced by the electromagnetic radiation from the planets. Turn up the volume and listen carefully. Perhaps it is possible to recognize things from the planets. Why does that particular planet make that sound? <http://canyouactually.com/nasa-actually-recorded-sound-in-space-and-its-absolutely-chilling/>

## Activity 1: What is sound?

Create an exciting sound by hitting two things together. Ask the children what they hear. Follow up by asking if anyone knows what sound really is.

other follow-up questions may be:

- how do we hear?
- why do we hear?
- what do the different sounds sound like?
- can the sound be described?

Try to follow up the children's comments with new questions that make them wonder.

Return to the question *What is sound?*

Ask the children to place their hands on a table or surface. Tap the table so they can feel the vibrations in their fingers. What do they feel? The vibrations they feel are exactly the same as what happens in the air when we make sound. The air vibrates.

Create sounds together. Try varying the volume and tempo. Ask the children to describe the sounds you make. Can they draw the sounds?



Image: ASE

## Activity 2: Who hears best?

This activity can be done together with activity 1 or at another time. Let the children's questions and interest drive the conversation and the project forward.

What is it that allows us to hear things? Most children are probably able to answer that we hear with our ears.

Ask the children to cup their hand behind their ears. Do they hear sounds better? What if they put their fingers in their ears? What happens then?

Are there some creatures that hear better than others? What animals do they know with big ears? Use images of various animals and discuss.

If we move away from the known animals on Earth and look at familiar space creatures, can we do the same activity? Find images of i.e. Master Yoda from Star Wars and ET. Compare the two images. Who do the children think have best hearing?

Can you draw more creatures, animals, people or aliens with various ears?

What is needed for these creatures to see well too?



### Activity 3: Sounds in space

Bring the children on a fantasy journey into space. Put on spacesuits, close your eyes and imagine yourself fly off through the atmosphere and into the great universe. What can we hear? There is a spaceship. What sound can we hear from it? And look, there is a giant nebula. Look how beautiful it is. What sounds do we hear from it?

The truth is that there are no sounds in space. Do you remember the vibrations in the table when we knocked on it? In space it is completely empty, no air and no atmosphere, it is completely empty. This means that the vibrations do not work and therefore we do not hear any sounds either.

In space, however, there are other waves. There we can find different types of light waves. It is possible to collect these light waves and send them through a machine that turns the waves into sound that we can hear? NASA has done this and found that all the planets in our solar system make different sounds, including the sun. Just listen to this <http://canyouactually.com/nasa-actually-recorded-sound-in-space-and-its-absolutely-chilling/>

Why do these planets make different sounds? What are we actually listening to? There are no right or wrong answers here and only the imagination sets the limits.

Can we draw the planets and the sounds they make?

Can we make our own sounds that could belong to other planets? What will those planets look like? What creatures might live there?

## Where do we go now?

Space is a topic that interests most children, and hopefully this activity has triggered their curiosity to explore further.

Allow the interests of the children to decide how to continue the project.

- Will you travel through the solar system? To the sun or the other planets?
- Or will you travel to an entirely different galaxy?
- Can we go to the end of space? How big is space?
- Are you looking for life other places in space?
- Are you space scientists?
- Or space explorers?

Only the imagination sets the limits. Look at the set of resources from Andøya Space Education and create your own project about space.

Gathering time is a great way to allow the children to share their experiences. Make up stories or songs and pull space into the kindergarten. Create a nook where the children can sit and look at books or pictures about space. Maybe you can invite parents and families to an exhibition to see what you are working on?

Such a project is the perfect arena for using educational documentation in the kindergarten. Use assemblies or other gatherings to reflect and discuss what you have learned and what you want to do now.

[Teddynaut](#) has his own page where he answers questions about space related topics from children. Check him out.



## Sources

- This resource is created by Andøya Space Education for ESERO Norway.